CERTIFICATE

I, the undersigned, Takashi KISO, residing at 5th Floor, Shintoshicenter Bldg., 24-1, Tsurumaki 1-chome, Tama-shi, Tokyo 206-0034 Japan, hereby certify that to the best of my knowledge and belief the following is a true translation into English made by me of Japanese Patent Application No. JP10-092929 filed on April 6, 1998.

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[NAME OF DOCUMENT]   SPECIFICATION

[TITLE OF THE INVENTION]   AN INTERNET FACSIMILE APPARATUS

[SCOPE OF CLAIMS FOR PATENT]

5   [Claim 1] An Internet facsimile apparatus comprising:

circuit controlling means for controlling data communicated via a public circuit network and the Internet;

identifying means for identifying contents of
10   recipient's terminal during a communication control protocol using the public circuit network; and

communication path deciding means for deciding a communication path of data based on the identification result of said identifying means.

15   [Claim 2] The Internet facsimile apparatus according to claim 1, wherein said circuit controlling means carries information, representing that the self-station has an Internet facsimile function, on a transmission control signal during
20   the communication control protocol using the public circuit network.

[Claim 3] The Internet facsimile apparatus according to claim 1 or 2, wherein said circuit controlling means carries a mail address of the
25   self-station on the transmission control signal during the communication control protocol using the public circuit network.

[Claim 4] The Internet facsimile apparatus

according to any one of claims 1 to 3, wherein said circuit controlling means carries an apparatus capability of the self-station on the transmission control signal during the communication control

5 protocol using the public circuit network.

[Claim 5] The Internet facsimile apparatus according to any one of claims 1 to 4, wherein said identifying means identifies whether or not the recipient's terminal has the Internet facsimile

10 function during the communication control protocol using the public circuit network.

[Claim 6] The Internet facsimile apparatus according to any one of claims 1 to 5, wherein said identifying means identifies the mail address of the

15 recipient's terminal during the communication control protocol using the public circuit network.

[Claim 7] The Internet facsimile apparatus according to any one of claims 1 to 6, wherein said identifying means identifies during the

20 communication control the apparatus capability of the recipient's terminal during the communication control protocol using the public circuit network.

[Claim 8] The Internet facsimile apparatus according to any one of claims 1 to 7, wherein said

25 identifying means stores the apparatus capability of the recipient's terminal and said communication path deciding means automatically decides a communication path based on the apparatus capability

of the recipient's terminal stored.

[Claim 9] The Internet facsimile apparatus according to any one of claims 1 to 8, wherein said communication path deciding means changes the communication path from the public circuit network to the Internet when determining that the recipient's terminal possesses the Internet facsimile function during the communication protocol using the public circuit network.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[Technical Field of the Invention]

The present invention relates to an Internet facsimile apparatus possessing an Internet facsimile function in addition to G3 facsimile function or G4 facsimile function.

[0002]

[Prior Art]

As a conventional facsimile apparatus, there were generally used G3 facsimile apparatuses for performing data communication using an analog network, G4 facsimile apparatuses for performing data communication using a digital network such as ISDN. In contrast to this, there have recently become commercial the Internet facsimile apparatuses, which performs data communication using the Internet in addition to the G3 facsimile or G4 facsimile.

[0003]

The conventional Internet facsimile apparatuses perform data communication using the Internet when the communication partner has the Internet facsimile function, and perform data communication using the analog network and the digital network (hereinafter referred to as "public circuit network (PSTN)" in a word) when the communication partner has no Internet facsimile function.

[0004]

[Problems for Solving the Problems]

However, since the conventional Internet facsimile apparatuses cannot perform an automatic recognition of whether or not the recipient's terminal possesses an Internet facsimile function, an operator must check whether or not the recipient communication possesses the Internet facsimile function in advance.

[0005]

The present invention has been made with consideration given to the aforementioned point, and an object of the present invention is to provide an Internet facsimile apparatus that is capable of automatically recognizing whether or not a recipient's terminal possesses the Internet facsimile function.

[0006]

[Means for Solving the Problems]

In order to solve the aforementioned problem, the present invention takes the following measures.

The Internet facsimile apparatus described in claim 1 adopts the configuration comprising circuit controlling means for controlling data communicated via a public circuit network and the Internet; identifying means for identifying contents of recipient's terminal during a communication control protocol using the public circuit network; and communication path deciding means for deciding a communication path of data based on the identification result of said identifying means.

[0007]

With this configuration, it is possible to recognize the contents that the partner possesses between communication terminals mutually using a non-standard command during the control protocol at the time of carrying out communication via the public circuit network.

[0008]

Moreover, the invention described in claim 2 adopts the configuration wherein said circuit controlling means carries information, representing that the self-station has an Internet facsimile function, on a transmission control signal during the communication control protocol using the public circuit network in the Internet facsimile apparatus described in claim 1.

[0009]

Furthermore, the invention described in claim

5 adopts the configuration wherein said identifying means identifies whether or not the recipient's terminal has the Internet facsimile function during the communication control protocol using the public circuit network in the Internet facsimile apparatus described in any one of claims 1 to 4.

[0010]

Still moreover, the invention descried in claim 8 adopts the configuration wherein said identifying means stores the apparatus capability of the recipient's terminal and said communication path deciding means automatically decides a communication path based on the apparatus capability of the recipient's terminal stored in the Internet facsimile apparatus described in any one of claims 1 to 7.

[0011]

With these configurations, when the recipient's terminal has the Internet facsimile function, it is possible to automatically select communication over the reasonable Internet even if an operator does not specify the kind of transmission at a next communication and the following.

[0012]

Moreover, the invention described in claim 3 adopts the configuration wherein said circuit controlling means carries a mail address of the self-station on the transmission control signal during the communication control protocol using the

public circuit network in the Internet facsimile apparatus described in claim 1 or 2.

[0013]

Moreover, the invention described in claim 6 adopts the configuration wherein said identifying means identifies the mail address of the recipient's terminal during the communication control protocol using the public circuit network in the Internet facsimile apparatus described in any one of claims 1 to 5.

[0014]

With these configurations, since it is possible to recognize the mail address of the recipient's terminal, the mail address of the recipient's terminal is displayed at a next communication and the following, making it possible to eliminate the operator having to check the mail address.

[0015]

Moreover, the invention described in claim 4 adopts the configuration wherein said circuit controlling means carries an apparatus capability of the self-station on the transmission control signal during the communication control protocol using the public circuit network in the Internet facsimile apparatus described in any one of claims 1 to 3.

[0016]

Still moreover, the invention described in claim

8

7 adopts the configuration wherein said identifying means identifies during the communication control the apparatus capability of the recipient's terminal during the communication control protocol using the

5 public circuit network in the Internet facsimile apparatus described in any one of claims 1 to 6.

[0017]

   With these configurations, since it is possible to recognize the apparatus capability of recipient's

10 terminal, transmission information suitable for the partner's capability can be selected to make it possible to solve the pending problem in which when the transmitter side performs transmission with information exceeding the partner's capability, the

15 receiver side cannot deal with such transmission information to result in the occurrence of an error so that a capability must be reduced to a predetermined minimum set to perform transmission.

[0018]

20   Furthermore, the invention described in claim 9 adopts the configuration wherein said communication path deciding means changes the communication path from the public circuit network to the Internet when determining that the recipient's terminal possesses

25 the Internet facsimile function during the communication protocol using the public circuit network in the Internet facsimile apparatus described in any one of claims 1 to 8.

[0019]

     With this configuration, since the communication path can be changed to the Internet from the public circuit network prior to transmitting
5 message data, the use of the pubic switched telephone network is applied to only the part of the control protocol, so that reasonable facsimile communication can be implemented.

[0020]

10   [Embodiment of the Invention]

     An embodiment of the present invention will be more specifically explained with reference to the accompanying drawings.

     FIG. 1 is a block diagram illustrating the
15 configuration of the Internet facsimile apparatus according to one embodiment of the present invention.

[0021]

     In an Internet facsimile apparatus 101 (hereinafter referred to as "present apparatus"
20 illustrated in FIG. 1, an operation panel 1 converts an instruction entry from an operator to an electrical signal, and outputs it to an apparatus controlling section 2. the apparatus controlling section controls the respective sections based on the electrical
25 signal input from the operation panel. A facsimile section 3 scans an original in accordance with the instruction of the apparatus controlling section 2, stores read data to memory 4, and outputs data stored

in the memory 4 to recording paper. A public circuit controlling section 5 transmits data stored in the memory 4 to a recipient's terminal 102 via a public circuit network 6, and stores data transmitted from

5   the recipient's terminal to the memory 4. A network controlling section 7 transmits data stored in the memory 4 to the recipient's terminal 102 via the Internet 8, and stores data transmitted from the recipient's terminal to the memory 4. A possession

10   function table 9 is a storing area where possession function data of a communication partner is stored.
[0022]

The apparatus controlling section 2 has an operation kind determining section 21 for determining

15   a kind of operation from the electrical signal input from the operation panel 1, a facsimile controlling section 22 for controlling the facsimile section 3 in accordance with an instruction from the operation kind determining section 21, a communication path

20   deciding section 23 for deciding a communication path of data based on information of the possession function table 9, and a possession function identifying section 24 for determining the possession function of the recipient's terminal from data stored

25   in the memory and stores the determination result to the possession function table 9.
[0023]

Among these, when the recipient's terminal

instructed from the operation kind determining section 21 has no Internet facsimile function based on information of the possession function table 9, the communication path deciding section 23 instructs

5 the public circuit controlling section 5 to transmit data stored in the memory via the public circuit network 6. Also, when the recipient's terminal instructed has the Internet facsimile function, the communication path deciding section 23 instructs the

10 network controlling section 7 to perform transmission over the Internet 8.

[0024]

Moreover, the possession function identifying section 24 identifies the presence or absence of

15 information (hereinafter referred to as "IFAX function"), which indicates that the Internet facsimile function of recipient's terminal is possessed, from a control signal, which is sent from the recipient's terminal and which stored in the

20 memory 4, and the contents of such as mail address, apparatus capability, etc., and writes the result to the possession function table 9.

[0025]

An explanation will be next given of a

25 communication protocol of the Internet facsimile apparatus according Embodiment 1 of the present invention using a sequence view of FIG. 2. Here, it is assumed that the present apparatus 101 is a side

where message data is transmitted and that the recipient's terminal 102 where reception is performed is used as an Internet facsimile apparatus having the same configuration as that of the present apparatus 101 and that the present apparatus 101 has not yet recognized the function which the recipient's terminal 101 possesses. Moreover, it is assumed that the public circuit controlling circuit 5 performs transmission and reception of data using the communication protocol of G3 facsimile.

[0026]

First, an operator inputs a telephone number on the recipient's terminal from the operation panel 1 to enter an instruction of transmission, and the facsimile section 3 scans an original under control of the facsimile controlling section 22 so as to store data converted to an electrical signal in the memory 4.

[0027]

Then, the communication path deciding section 23 determines decides whether or not the recipient's terminal 102 has the IFAX function based on information stored in the possession function table 9. In this example, since the present apparatus 101 has not yet recognize the function that the recipient's terminal possesses, the communication path deciding section 23 provides an instruction command information to the public circuit controlling

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section 5 to execute communication in accordance with the communication protocol of G3 facsimile.

[0028]

When the foregoing preparation for transmission is made, the public circuit controlling section 5 generates a call to the recipient's terminal 102 via the public circuit network 6, and communication using the G3 facsimile protocol is started (F201).

[0029]

When the incoming call is detected, CDE (Called Station Identification) is transmitted to the present apparatus 101 from the recipient's terminal 102 in case of an automatic incoming call (F202). It should be noted that CED is an optional signal and is not always transmitted.

[0030]

Next, control signals (hereinafter referred to as "NSF signals") each containing NSF (Non-Standard Facilities), indicative of non-standard facilities, and DIS (Digital Identification Signal) are transmitted from the recipient's terminal 102 to the present apparatus 101 (F203, F204).

[0031]

FIG. 3 is a frame structural view of the NSF signal transmitted from the IFAX apparatus according to the above-mentioned embodiment. As shown in FIG. 3, the NFS signal comprises a flag sequence (F), an address field (A), a control field (C), a facsimile control

field (FCF) using NSF, a facsimile information field
(FIF), a frame check sequence (FCS), and a flag
sequence (F).

[0032]

5   According to this embodiment, in FIF, the IFAX
function, mail address, and apparatus capability are
contained in addition to the existing facsimile
functions. The apparatus capability includes the
linear density, print paper size, and the image coding

10   system, which are necessary for facsimile communication.
[0033]

       The NSF signal transmitted from the recipient's
terminal 102 passes through the public circuit network 6
and is stored the memory 4 via the public circuit controlling

15   section 5 of the present apparatus 101. Then, the possession
function identifying section 24 identifies the IFAX
function, mail address, and apparatus capability and
writes the identified contents to the possession
function table 9.

20   [0034]

       This makes it possible for the present apparatus 101
to automatically select communication over the Internet
without the operator having to specify the kind of
transmission at a next communication and the following when

25   the recipient's terminal 102 has no Internet facsimile
function.

[0035]

       Moreover, since the present apparatus 101 can recognize

the mail address of recipient's terminal 102, the operator does not have to check the mail address of the recipient's terminal 102 if the mail address of the recipient's terminal 102 is displayed on the display section (not shown).

5 [0036]

Moreover, since it is possible to recognize the apparatus capability of recipient's terminal, the present apparatus 101 can select transmission information suitable for the partner's capability

10 and solve the pending problem in which when the transmitter side performs transmission with information exceeding the partner's capability, the receiver side cannot deal with such transmission information to result in the occurrence of an error

15 so that a capability must be reduced to a predetermined minimum set to perform transmission.

[0037]

It should be noted that message data can be retransmitted through the Internet facsimile

20 communications when an error occurs in course of communication in F204 and the following shown.

[0038]

Backing to FIG. 2, after transmitting NSF signal, a control signal (hereinafter referred to as "NSS signal")

25 including NSS (Non-Standard Set-up), which is a transmission command to NSF signal, is transmitted (F205). The frame structure of NSS signal is the same as that of NSF signal, and has the self-IFAX function, the self-

mail address, and the self-apparatus capability in FIF.

[0039]

When the NSS signal is normally received by the recipient's terminal 102, a reception preparation confirmation signal CFR (Confirmation to Receive) is sent back to the present apparatus 101 (F206).

[0040]

When CFR is received by the present apparatus 101, a disconnection command DCN (Disconnect) is transmitted from the public circuit controlling section 5 and the circuit is temporarily disconnected (F207).

[0041]

Then, the mode of communication is changed to the Internet facsimile communication and transmission of message data is started from the network controlling section 7 over the Internet 8, and message data is all transmitted, so that communication is ended (F208).

[0042]

This makes it possible to restrain operation time using the communication protocol of G3 facsimile with high communication charge to only the pre-protocol for capability exchange so as to reduce the communication charge.

[0043]

Additionally, the present apparatus 101 can transmit message data in G3 facsimile communication without changing the mode of communication and perform the Internet facsimile communication from the next communication.

[0044]

Also, after the end of communications, the present apparatus 101 can display the IFAX functions of the recipient's terminal, mail address, and apparatus capability on the display section (not shown), and can carry out a journal output to the printer 3. Thereby, the operator can easily recognize whether or not the recipient's terminal possesses the IFAX functions and the Internet facsimile function can be used in the communication and the following.

[0045]

Additionally, in the aforementioned embodiment, the IFAX function of the self-station, the mail address of the self-station and the capability of the self-station are included in the NSF signal and NSS signal in accordance with the present protocol. However, if the protocol is changed in the future, it is possible to include them in the other signal in the other signal so as to be transmitted.

[0046]

Moreover, the above-mentioned embodiment explained the case in which G3 facsimile communication was taken as an example. However, the same effect as that of the present invention can be obtained in the facsimile communication by the other protocol such as G4 facsimile communication, etc.

[0047]

[Effect of the Invention]

As is obvious from the aforementioned explanation, according to the present invention, G3 facsimile or G4

facsimile communication and the Internet facsimile communication can be organically connected to each other, the presence or absence of the Internet facsimile of the communication partner, mail address and apparatus capability

5 can be mutually transmitted during the communication protocol of G3 facsimile or G4 facsimile, so that the reduction in communication charge can be improved by the change in the communication method.

[BRIEF DESCRIPTION OF THE DRAWINGS]

10   [FIG. 1]

A block diagram illustrating the configuration of the Internet facsimile apparatus according to one embodiment of the present invention.

[FIG. 2]

15   A sequence view illustrating transmission and reception of the signal of the Internet facsimile apparatus according to the embodiment.

[FIG. 3]

A frame structural view illustrating the structure of

20 a control signal including NSF of the Internet facsimile apparatus according to the embodiment.

[Description of the Symbols]

1 Operation panel section

2 Apparatus controlling section

25 3 Facsimile section

4 Memory

5 Public circuit controlling section

6 Public circuit network

7 Network controlling section

8 Internet

9 Possession function table

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[NAME OF DOCUMENT] ABSTRACT

[Abstract]

[Object] Whether or not a recipient's terminal has the Internet facsimile function is recognized by a public circuit in the course of communication and a transmission path of message data is automatically decided.

[Overcoming Means] A public circuit controlling section 5 carries information, representing that the Internet facsimile function is provided, on a signal A possession function identifying section 24 reads information, representing that a recipient's terminal 102 has the Internet facsimile function, from data stored in memory, and stores it in a possession function table 9. A communication path deciding 23 decides a transmission path of message data based on information stored in the possession function table 9.
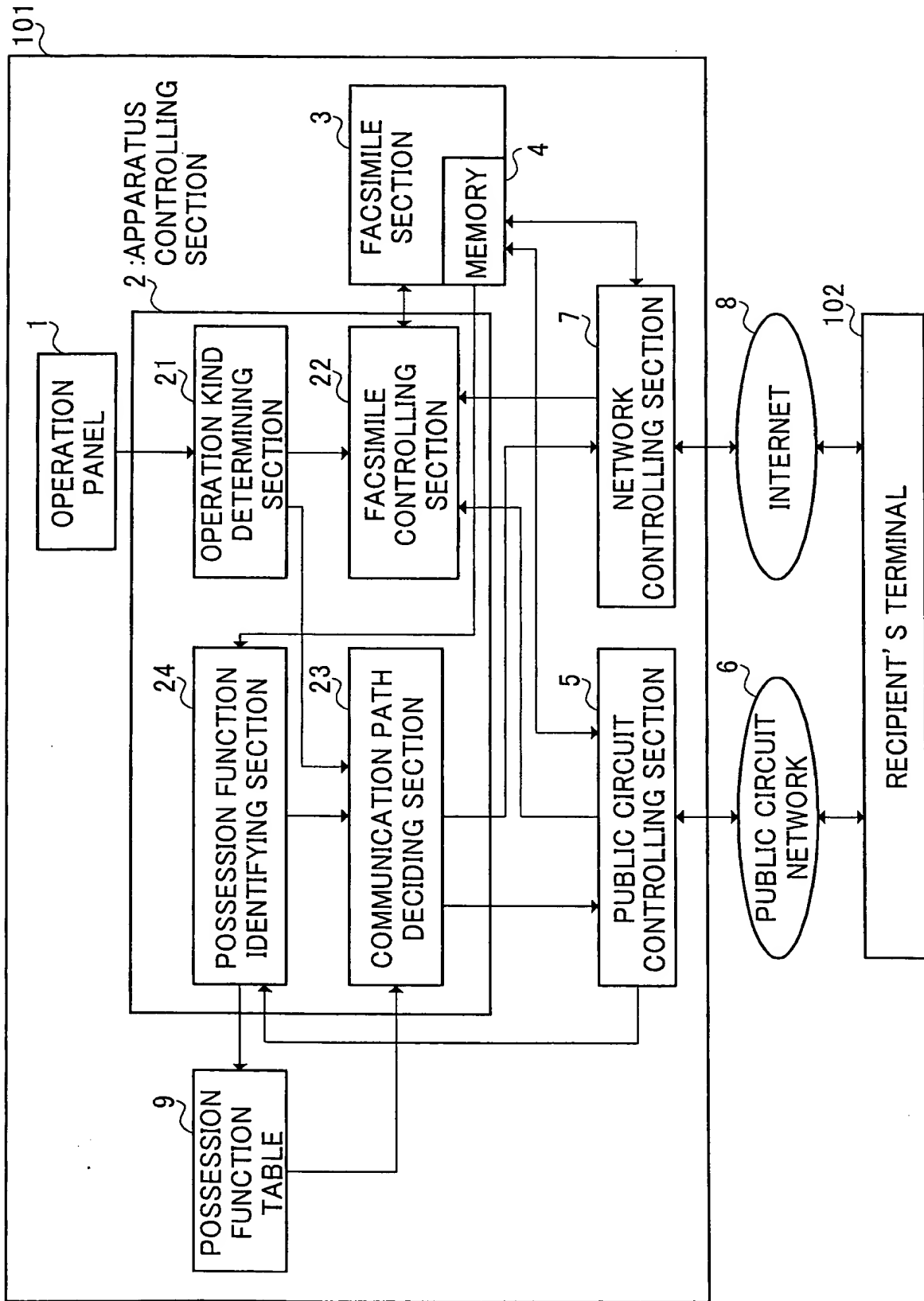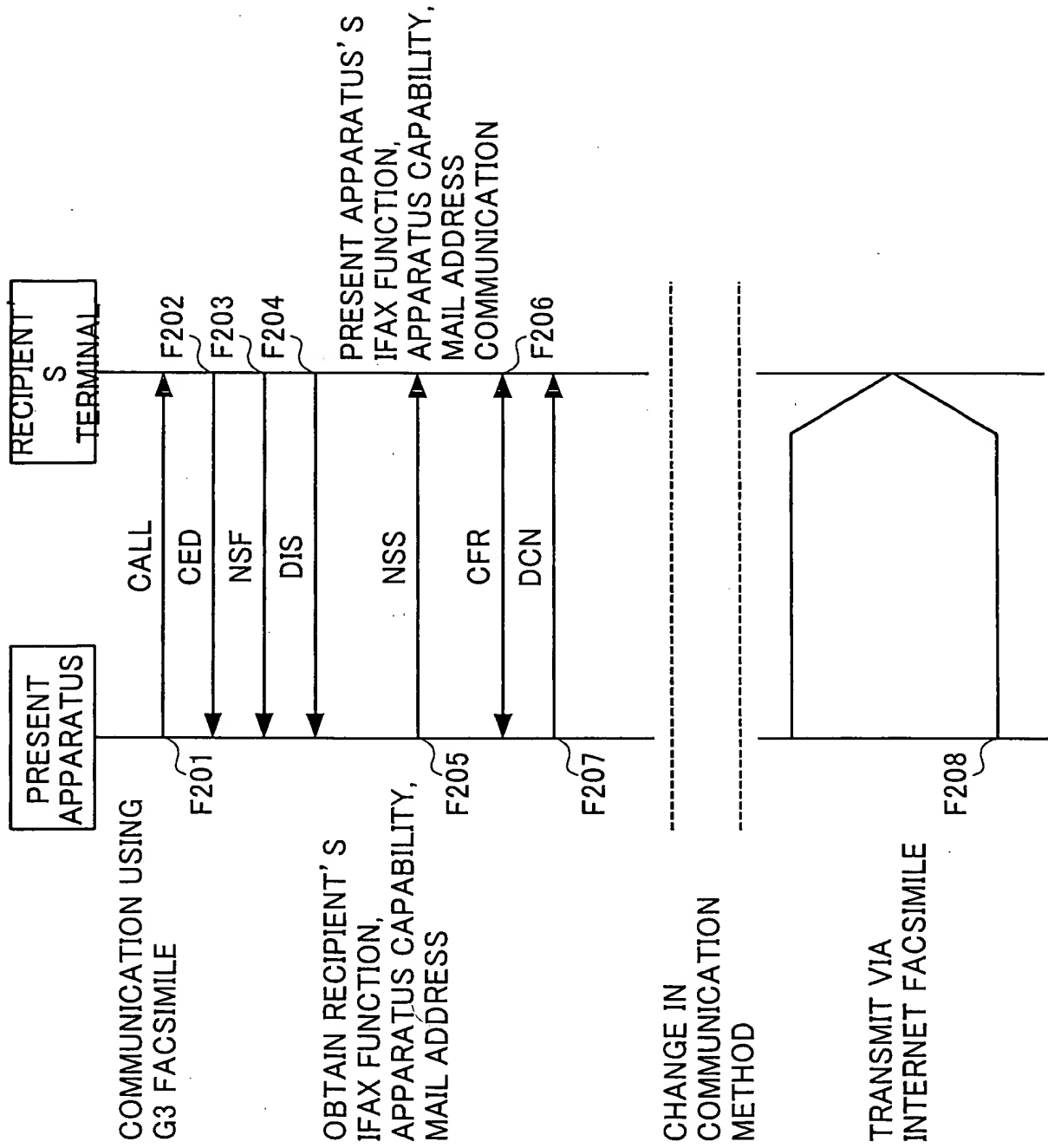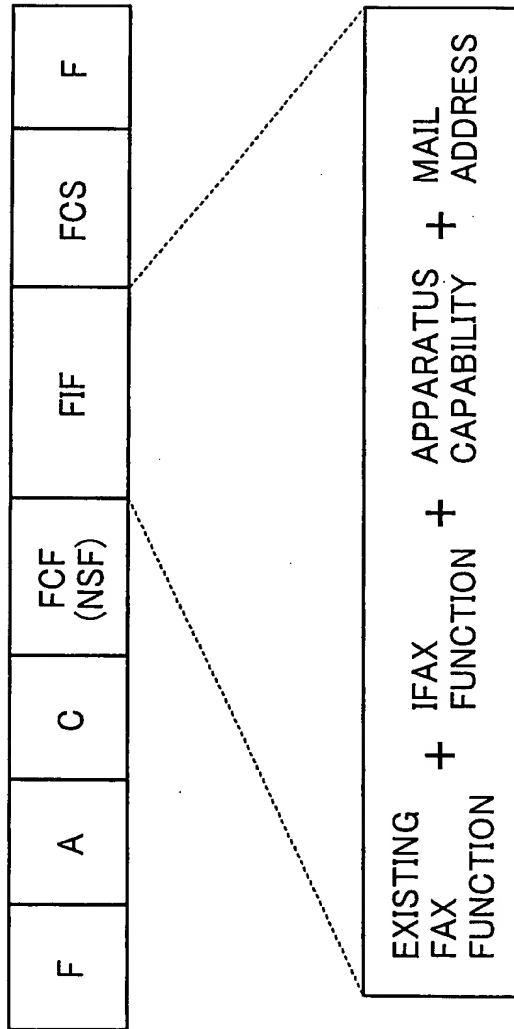
[Selected Drawings] FIG. 1

FIG.1

FIG.2

| F | A | C | FCF (NSF) | FIF | FCS | F |

EXISTING FAX FUNCTION + IFAX FUNCTION + APPARATUS CAPABILITY + MAIL ADDRESS

FIG.3